DOCUMENT RESUME

ED 477 104 IR 021 832

AUTHOR	Wang, Li; Speaker, Richard
TITLE	Investigating Education Faculty's Perspectives of Their Experiences in a Technology Project: Issues and Problems Related to Technology Integration.
PUB DATE	2002-06-00
NOTE	7p.; In: ED-MEDIA 2002 World Conference on Educational Multimedia, Hypermedia & Telecommunications. Proceedings (14th, Denver, Colorado, June 24-29, 2002); see IR 021 687.
AVAILABLE FROM	Association for the Advancement of Computing in Education (AACE), P.O. Box 3728, Norfolk, VA 23514. Tel: 757-623-7588; e-mail: info@aace.org; Web site: http://www.aace.org/DL/.
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Assisted Instruction; *Computer Attitudes; *Computer Uses in Education; *Educational Technology; Higher Education; Instructional Effectiveness; *Teacher Attitudes; Teacher Education; *Technology Integration
IDENTIFIERS	*Technology Implementation

ABSTRACT

The International Society for Technology in Education (ISTE) (1999) stated it is important to study models that are making effective use and integration of technology in teacher education on an ongoing basis. The purpose of this study is to respond to this need by portraying three education faculty members after they experienced a federally funded technology-based project. Their practices, beliefs, and experiences are the focus of this study. Findings include: (1) the range of previous experiences with technology varies dramatically, but all participants have used some computers for personal and professional tasks; (2) although actively learning to integrate technology and seeing positive impacts on their students, they do not believe that technology is the only tool for effective instruction; and (3) gender, age, social networking, access to current hardware and access to technical support remain issues needing consideration in the design of technology implementation in higher education settings. (Contains 11 references.) (Author)

Reproductions supplied by EDRS are the best that can be made
from the original document.

Investigating Education Faculty's Perspectives of Their Experiences in a Technology Project: Issues and Problems Related to Technology Integration

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

G.H. Marks

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Li Wang and Richard Speaker
Department of Curriculum and Instruction
University of New Orleans

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Abstract: The ISTE (1999) stated it is important to study models that are making effective use and integration of technology in teacher education on an ongoing basis. The purpose of this study is to respond to this need by portraying three education faculty members after they experienced a federally funded technology-based project. Their practices, beliefs, and experiences are the focus of this study. Findings include 1) the range of previous experiences with technology varies dramatically, but all participants have used some computers for personal and professional tasks; 2) although actively learning to integrate technology and seeing positive impacts on their students, they do not believe that technology is the only tool for effective instruction; and 3) gender, age, social networking, access to current hardware and access to technical support remain issues needing consideration in the design of technology implementation in higher education settings.

ED 477 104

Many educators today are facing the issue of integrating technology into their instruction. They no longer limit themselves to textbooks, chalk, and handouts to deliver course content because they are facing an increasing need to adjust their approaches to "teaching, preparing contents and delivering learning materials in accordance with" emerging technologies (Neo & Neo, 2001, p. 328). Some teachers have experienced great success in making effective use and integration of technology, but many teachers are still struggling with technology. This paper examines the beliefs and practices of education faculty regarding their integration and implementation of technology. In particular, what are the perceptions of their experiences after they participated in a year-long project to implement technology in their instruction?

Literature Review

Most faculty members have realized the positive impact that technology brings to students and believe that it is important to increase technology integration in the classroom. However, there is a significant gap between their beliefs and their practices. The factors underlying this situation include teachers' beliefs, fears of technology, reluctance to change, lack of access, and lack of technical and administrative support (Ertmer, 1999). Both external and internal factors may impede technology integration; external factors include access to technology, funding, and administrative and technical support, while internal factors are intrinsic to teachers, such as personal fear of technology, traditional teaching style, and reluctance to adapt (Ertmer, 1999). The internal barriers are often more difficult to identify and overcome than the external factors, because they are "less tangible" and "more personal and deeply ingrained" (Ertmer, p. 51), and these barriers can completely block implementation. Ertmer found that the focus on helping teachers integrate technology has been on grappling with the external factors but training programs have started to "incorporate pedagogical models of technology use as one means of addressing internal barriers" (p. 47). Ertmer also addressed the complexities of relationships between the external and internal factors and the strategies to overcome the two barriers to help faculty members incorporate technology into their classrooms efficiently.

What should faculty do?

IR021832

BEST COPY AVAILABLE

First, before teachers integrate technology into the classroom, they should possess proficiencies with technology and develop a desire to apply technology in their instruction. This desire incorporates the premise that they have been provided with access to technology resources, technical support and training. Second, teachers should possess the knowledge of how to integrate technology into their classroom. Throwing a computer and software into the classroom is not integration. According to (Ertmer, 1999), successful integration involves careful evaluation of the curriculum and learning goals. Teachers should develop careful plans for improvement and assessment, and they should also be able to follow models that can help develop their own plans (Ertmer, 1999).

What can school/university systems do?

To help faculty members make effective use of technology and integrate technology into instruction, systems should provide proper and sufficient training and technical support. Only technology access combined with technical training, support, and assistance with using technology will serve as a significant motivation. Technology integration depends on facilities; however, other factors that influence integrating technology include faculty professional development and course-development time, which provide opportunities and time for teachers to concentrate on technology (ISTE, 1999).

Giving teachers sufficient time to plan students' technology experiences is one practice that facilitates technology integration. Teachers need to spend sufficient time planning how technology integrated is going to function most effectively, and determine the best practice to enhance students' learning outcomes (Walker, Ennis-Cole, & Ennis III, 2000). Teachers need to consider the necessary course content to be delivered in a normal class and to evaluate the impact that technology will have on teaching and learning (Lawler, Rossett & Hoffman, 1998, Walker, Ennis-Cole, & Ennis III, 2000).

Background of the Project

This project, according to Speaker and Dermody (Speaker, et al, 2001) is part of a $1.2 million grant from Preparing Tomorrow's Teachers to Use Technology (PT3), initiative of the U.S. Department of Education. The consortium, focused on strategically implementing technology in the classroom, is comprised of six partner schools working closely with two universities. The major purpose (Speaker, et al, 2001) is to make modern multimedia computer technology ubiquitous in content and methods courses, and field experiences for future teachers. Faculty and students in teams from the two institutions participate in the project and implement instruction using technology in their courses and field experiences with children in partner schools. This project (Speaker, et al, 2001) uses the model of teachers teaching teachers developed initially in the Bay Area Writing Project to produce teaching with technology. Over last two years, the project has involved 40 university faculty, approximately 100 university students as student technology mentors (STM), more than 2,000 other university students, and approximately 2,250 learners in 40 classrooms in 6 schools in the area. This project focuses on the training of both pre-service teachers and university faculty through summer institutes, as well as through numerous mini-session trainings, one-on-one tutoring and mentoring. These training courses cover a range of topics including web design, Internet in the classroom, presentation software, integrated curriculum, and video on the web (Speaker, et al, 2001).

Methodology

In this project, faculty members are categorized as Faculty Technology Participant (FTP), and student participants are categorized as Student Technology Mentor (STM). Each faculty member was assigned an STM to assist with teaching and preparation. Both FTPs and STMs attended a summer institute, in which they learned technology from invited teachers, students and faculty members who are using technology. These presenters share with their experience and demonstrate how they model technology implementation in their classrooms. Faculty and students completed individual projects using technology or completed a project on a cooperative basis. Processes began with a simple form to collect

some demographic information from three FTPs. After that, course syllabi, which faculty developed after they participated the summer institute, were analyzed. Based on the analysis and review of literature, we developed interview questions to delve deeper into the personal world of faculty members who are integrating technology into their classrooms.

Interpretivism, a "philosophy of science related to constructivist theory in psychology and to forms of research" (Willis, Thompson, & Sadera, 1999, p. 34), best suits this study. Interpretivists believe that it is difficult to find make valid generalizations about human behavior in social science due to the individual differences. Instead of making generalizations, Willis, Thompson, and Sadera indicated that interpretivism emphasizes understanding the individuals and interpreting them. What is true for one group does not necessarily stand true for another group since each group might be unique in certain ways (Willis, Thompson, & Sadera, 1999). The reasons to choose qualitative rather than quantitative design are manifold. First, our personal biases towards qualitative research present it as a flexible and non- restrictive method, which we can use to understand individuals' perceptions and processes. Second, our research question determined that this study should use qualitative design because the purpose of this study was to investigate the perspectives of education faculty members' experience in a technology project. This study was completed in a natural setting without the involvement of experimental and control groups. Third, since the number of faculty members who have participated in this project is relatively small, it is not possible to obtain a sample size to make valid and reliable quantitative generalizations. Fourth, ISTE (1999) suggests that future researchers should observe classroom activities, interview teachers, and analyze technology-based lesson plans to seek concrete evidence of effectiveness.

Process

Three faculty members, two female and one male, who had participated in the project gave consent to be interviewed. Each interview lasted thirty minutes to an hour. Semi-structured interviews were based on prepared a list of interview questions and audio taped. After transcription, the data were synthesized with demographic information, the electronic journals from the summer institute, and course syllabi to confirm the analyses. Transcripts and other data were coded as themes emerged. Follow-up interviews with member checking of the interpretations occurred after the initial data reduction.

Findings

There are some commonalities among the three faculty members and individual differences as well. The similarities and differences include previous experiences with technology, attitudes toward participation, beliefs and practices, technologies' impacts on students, and issues relating to gender, age, social networking, access to current hardware and access to technical support.

Previous Experiences

All three teachers had some experiences with technology prior to the participation of the grant project. Their experiences ranged from word processing and Internet browsing to PowerPoint presentations and web page design. Each had an office computer with access to a university local area network and e-mail. They had access to two computer labs in the building and supposed access to a faculty multimedia development lab which was usually locked, unavailable and unstaffed. Two of the faculty members mainly used computers for word processing, emails for communication and Internet browsing to search for information for their teaching and research. They did not develop web pages prior to the project. The third faculty developed web pages using HTML prior to the project and posted his course syllabi online and links for students to retrieve information about how to conduct research. He used some software similar to PowerPoint prior to the project in his classrooms.

Attitudes Toward the Participation

The three faculty members demonstrated satisfaction with the whole experience of the project. One is very happy to see her accomplishments in terms of products. The other two consider the project has provided a large variety of resources and support to motivate their learning, interests and rethinking of the goals of their instruction. "But I might argue that the project workshop in that summer was again the catalyst that recognize in my mind ... (it) allowed me to recognize in my mind the limitations that ... are associated with all the alternatives that I have available to me. The workshop did serve as a catalyst to at least allow me to understand what my needs were and how I could most effectively meet those needs, helping me because it forced me to rethink what I want to present in class." (Dr. Swanson, male). Walker, Ennis-Cole, and Ennis III (2000) say that teachers' positive experience in workshops and intensive institutes helps promote a sense of accomplishment or self-efficacy.

During their participation, each of the three faculty members was assigned one student technology mentor. All the three faculty members reported that their student technology mentors basically did not produce anything that they expected, due to mentors' lack of technological competency and proficiency, and conflicts of time schedule for the faculty and the student mentor to work together. So the mentor relationships were not productive according to the three faculty members. "And then I was assigned a person who is still in the program. She knew less than I did. Well, she is a marvelous person, did subsequently take my literature class. We are still working on...um...she didn't do much to help. . I met her and she joined in. Whenever I ask questions, she would certainly attempt to figure it out or tempted to work on it, but basically I went to (person a). Every problem I have, I just go to (person a), who is not involved in the grant at all. He is a computer support person. I went to him prior to the grant and I continue to use him as the chief source. I did ask my mentor to do a couple of projects for me. I don't want to give the impression that she is not completely compliant, willing, certainly she is and would independently go out and get her own help. I would ask her this is what I need in excel and later I would have it in my hands. And I wanted to have a powerpoint presentation made, and she did that." (Dr. Bonnett, female).

Beliefs and Practices

All three faculty members believe that technology is not THE answer to instruction. The purpose of using technology is to enhance teaching and learning. Technology is a tool, and so if one particular type of technology gets in the way, faculty will not use it; instead, they will seek other alternatives to improve their teaching. These three faculty members take a strong critical/evaluative view of the functions of technology which they are implementing in their instruction.

It is not surprising to find out that faculty's personal interest in technology is highly related to their motivation and adoption of technology. Therefore, the more interest one has, the easier it is to learn and incorporate technology into practice. Personal interest is also related to self-confidence and comfort. If individuals do not have an interest in learning technology and bringing technology into their classrooms, they will be reluctant to change practices and resist learning technology and technology infusion. When resistance exists, the level of confidence and comfort is crucial, influencing processes even though a faculty member may feel forced to bring technology into classroom to keep up with times.

After they participated in the technology-based project, the two female faculty members started to integrate technology into their classrooms. They developed their web pages for easy communication, information delivery and their own research. The male faculty member continually was working on his web pages to convert his website into a more non-linear site. He learned PowerPoint in the project and integrated it heavily into his classes.

Technology's Impact on Students

All faculty members see technology as a positive impact on students' learning. Through technology, students are no longer limited in their communication with peers and instructors. By using technology in their learning, students demonstrate enhanced learning outcomes in terms of activities and products. One faculty member mentioned teaching preservice teachers by modeling and requiring technology use in instruction so that preservice teachers can follow and integrate technology into their

academic activities and future classrooms. By watching how the instructors model the use of technology, students are able to use technology in their own academic activities and explore different learning resources. Dawson and Norris report (2000) that technology integrated into classroom by the instructor increased the possibility that preservice teachers transfer the computer skills into their classroom as compared to preservice teachers who learned computer skills in an isolated manner.

Issues

One interesting finding is that among the three participants, the male demonstrated higher motivation than female faculty members, and he is also the youngest (between 35 and 45; both female participants were over 45). He had already sought and received grants for further technology implementation in his courses. Ertmer and Hruskocy (1999) said the challenge that teachers face is to change the way they teach, which is often entrenched. In considering the idea of integrating technology into their instructional activities, many teachers find it difficult to confront their established beliefs about instruction and their traditional roles as classroom teachers. In addition, Becker (1994) reported that teachers' practices incorporating technology are not only dependent on teachers' personal interests in technological activities, but also highly correlated with gender, and this might be related to our culture, in which more males have patterns of personal interest that are "technical, mechanical, and numerical" (p. 311), which is consistent with having a deep interest in technology, specifically with computers. In this study, personal interest on an individual basis and gender basis has been identified as a major issue in promoting faculty members to use technology and incorporate technology into classrooms.

Other issues arise when faculty deal with technology. The two female faculty feel time is a problem because it always requires a large amount of time for them to deal with hardware and software. In Becker's report (1999), he distinguished difference among exemplary technology uses between female and male teachers. Becker indicated that female teachers usually have higher demands on time. If faculty members are not allowed sufficient time to construct their lesson plans, they may find integrating technology into classrooms ineffective.

Another factor is the faculty member's social network. The faculty member who is not very interested in technology and has experienced frustration mentioned that friends in some schools simply gave up whenever they encountered problems with technology, even without bothering to seek technical support. Presenters that this faculty member has met do not use Powerpoint to do presentations; instead, they use the traditional slideshows, so peer's views and practices influence faculty members' beliefs and practices.

In addition to requiring time, the male faculty member thinks it is important to update hardware so that it can meet the increasing needs. Faculty think that there are always problems with technology that they do not have sufficient technical skills to solve, so they are highly dependent on someone who is technologically savvy and has the expertise to deal with the situation. Faculty members feel that there should be someone to whom they can turn whenever they encounter technological problems. In this sense, technical support availability plays an important role in helping faculty members; it eases the pressures of learning new things and thus helps them integrate technology into their classrooms. Becker (1994) said available access to someone from whom teachers can learn or share experience with is very important in helping teachers incorporate technology.

Conclusions and Implications for Future Research

Three participants were involved in this study, two females and one male. Dr. Swanson and Dr. Bonnet are at their forties and fifties, while Dr. Greene is at her thirties and forties. Their teaching years of experience in higher education range from five to thirteen years. Although these faculty members had different experiences prior to the project, their attitudes toward participant, and beliefs and practices are undergoing changes as they use technology. They are either adding to their technology use or rethinking it, seeing the need to consider the technology as a tool through a critical evaluative lens. Issues continue to exist related to gender, age, access and currency of technology. Technologies have significant impact on

both teachers and students. They help both teachers and students reconceptualize their ways of working and thinking and strengthen the relations with the rapidly changing world. However, past studies show that teachers' professional development has not "kept pace with the rapid changes in the quality and quantity of information technology" (ISTE, 1999, p. 1). Factors that impede effective use and integration of technology have been identified as both external and internal factors. Future research should be more focused on factors that influenced faculty's use of technology and integration from studying both successful examples and unsuccessful examples, and these designs should balance gender and age.

References

Becker, H.J. (1994). How Exemplary computer-using teachers differ from other teachers: Implications for realizing the potential of computers in schools. Journal of Research on Computing in Education. 26(3), 291-321.

Becker, H.J. (1999). Internet use by teachers: conditions of professional use and teacher- directed student use. Teaching, Learning, ND computing: 1998 National Survey. Report #1. Irvine, CA: Center for Research on Information Technology and Organizations, University of California, Irvine. Available online: http://www.crito.uci.edu/TLC/FINDINGS/internet-use/.

Dawson, K. & Norris, A. (2000). Preservice teachers' experiences in a K-12/university technology-based field initiative: benefits, facilitators, constraints, and implications for teacher educators. Journal of Computing in Teacher Education. 17(1), 4-12

Ertmer, P.A. (1999). Addressing first-and second-order barriers to change: Strategies for technology integration. Educational Technology Research & Development, 47(4), 47-61.

Ertmer, P. & Hruskocy, C. (1999) Impacts of a university-elementary school partnership designed to support technology integration. Educational Technology Research and Development. 47 (1), 81-96.

International Society for Technology in Education (1999) Will new teachers be prepared to teach in a digital age?: a national survey on information technology in teacher education. Santa Monica, CA: Milken Family Foundation, commissioned by Milken Exchange on Education Technology

Lawler, C., Rossett, A., & Hoffman, R. (1998). Using supportive planning software to help teachers integrate technology into teaching. Educational Technology, 38(5), 29-34.

Neo, K. & Neo, M (2001) Multimedia technology: Using multimedia authoring tools to enhance teaching and learning in the classroom. Paper presented at the Annual Conferences of Technology in Teaching and Learning in Higher Education: An International Conference at June 27-29, 2001, Samos Island, Greece. 327-331.

Speaker, R.B., Dermody, M., Knighten, B., Wan, L., & Parigi, A. (2001). Student/Faculty relationships, methods courses and K-12 classrooms: examples of integration of technology in teacher education. Paper presented at the Annual Conferences of Technology in Teaching and Learning in Higher Education: An International Conference at June 27-29, 2000, Samos Island, Greece. 307-313.

Walker, M., Ennis-Cole, D., & Ennis, III, W. (2000) Down to the Nuts and Bolts: Considerations for the Infusion of Classroom Technology. Paper presented at the Annual Conferences of Technology in Teaching and Learning in Higher Education: An International Conference at August 25-27, 2000, Samos Island, Greece.115-120.

Willis. J., Thompson A., & Sadera, W. (1999). Research on Technology and teacher education: current status and future directions. Educational Technology Research & Development 47(4), 29-45.

BEST COPY AVAILABLE

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

[X] This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

[ ] This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").